Serial No. 10/038,174

## IN THE CLAIMS

Please amend claim 16 as follows:

1.      (PREVIOUSLY PRESENTED) An apparatus for adding auxiliary data $D_A$ to an output data stream, comprising:

a statistical multiplexer having a plurality of inputs including a first input, and an output providing the output data stream;

a first encoder, having an output communicatively coupled to the a first statistical multiplexer input, the first encoder for compressing a first data stream $D_l$ according to a first actual data rate $BW_{A_l}$ that is less than or equal to a first granted data rate $BW_{G_l}$ granted by the statistical multiplexer in response to a requested data rate $BW_{R_l}$ from the encoder, the difference between the first actual data rate $BW_{A_l}$ and the first granted data rate $BW_{G_l}$ defining an encoder overhead rate $BW_{OE_l}$ such that $BW_{G_l} - BW_{A_l} = BW_{OE_l} \geq 0$, the first encoder having an output including a compressed version of the first data stream $d_1$ provided at the actual data rate $BW_{A_l}$ and encoder null data $N_{E_l}$ at the overhead rate $BW_{O1}$; and

an auxiliary multiplexer, communicatively coupled to the statistical multiplexer, for sensing encoder null data $N_E$ and for substituting at least a portion of the auxiliary data $D_A$ for the encoder null data $N_E$.

2.      (CANCELED)

3.      (ORIGINAL)  The apparatus of claim 1, wherein the auxiliary multiplexer is communicatively coupled to the output of the statistical multiplexer.

4.      (ORIGINAL)  The apparatus of claim 3, further comprising a buffer, communicatively coupled to the auxiliary multiplexer, the buffer for buffering the auxiliary data.

5.      (ORIGINAL)  The apparatus of claim 4, wherein the auxiliary multiplexer substitutes the auxiliary data according to an unused memory of the buffer.

-2-

Serial No. 10/038,174

6.      (ORIGINAL) The apparatus of claim 3, wherein the auxiliary multiplexer further senses statistical multiplexer null data $N_{SM}$ and substitutes at least a portion of the auxiliary data for the multiplexer null data $N_{SM}$.

7.      (ORIGINAL) The apparatus of claim 3, wherein:
the statistical multiplexer manages the presentation of the first encoder output according to a first command input describing a target data rate of the output data stream $B_T$; and
the auxiliary multiplexer is communicatively coupled to the statistical multiplexer first input to command a change the target data rate of the output data stream $B_T$.

8.      (ORIGINAL) The apparatus of claim 7, further comprising a buffer, communicatively coupled to the auxiliary multiplexer, the buffer for buffering the auxiliary data, wherein the auxiliary multiplexer changes the target data rate according to an unused memory of the buffer.

9.      (ORIGINAL) The apparatus of claim 7, wherein the auxiliary multiplexer changes the target data rate according to one or more auxiliary data parameters selected from the group comprising:
a minimum auxiliary data rate $BW_{MIN}$ ;
a maximum auxiliary data rate $BW_{MAX}$ ;
a nominal auxiliary data rate $BW_{AVG}$ measured over a time period $t_{pr}$ ; and
a priority.

10.     (PREVIOUSLY PRESENTED) The apparatus of claim 7, wherein the change in the target data rate of the output data is commanded to decrease the target rate of the output data stream $B_T$ to permit the substitution of auxiliary data $D_A$ for the multiplexer null data $N_{SM}$ .

11.     (PREVIOUSLY PRESENTED) The apparatus of claim 7, wherein:
the auxiliary multiplexer further senses statistical multiplexer null data $N_{SM}$ and substitutes at least a portion of the auxiliary data for the multiplexer null data $N_{SM}$; and

-3-

Serial No. 10/038,174

the change in the target data rate of the output data is commanded to decrease the target rate of the output data stream $B_T$ to permit the substitution of auxiliary data $D_A$ for data selected from the group comprising the encoder null data $N_{E_1}$ and the multiplexer null data $N_{SM}$.

12.    (PREVIOUSLY PRESENTED)  The apparatus of claim 11, wherein the auxiliary data is added at a pre-specified minimum auxiliary data rate.

13.    (PREVIOUSLY PRESENTED)  The apparatus of claim 3, further comprising:

a second encoder, having an output communicatively coupled to the a first statistical multiplexer input, the first encoder for compressing a first data stream $D_2$ according to a first actual data rate $BW_{A2}$ that is less than or equal to a first granted data rate $BW_{G2}$ granted by the statistical multiplexer [in response to a requested data rate $BW_{R_2}$ from the encoder, the difference between the first actual data rate $BW_{A_{21}}$ and the first granted data rate $BW_{G_2}$ defining an encoder overhead rate $BW_{O2}$ such that $BW_{G_1} - BW_{A_1} = BW_{O_2} \geq 0$, the first encoder having an output including an compressed version of the first data stream provided at the actual data rate $BW_{A_{21}}$ and encoder null data $N_{E_1}$ at the overhead rate $BW_{O2}$, the second encoder having an output;

wherein the statistical multiplexer allocates data presented at the plurality of inputs to the statistical multiplexer output according to a statistical multiplexer second command input; and

wherein the auxiliary multiplexer is communicatively coupled to the statistical multiplexer second input to command a change in the allocation of the data presented at the plurality of inputs to the statistical multiplexer output.

-4-

Serial No. 10/038,174

14.     (PREVIOUSLY PRESENTED) The apparatus of claim 13, wherein the auxiliary multiplexer changes the allocation of the data presented at the plurality of inputs to the statistical multiplexer output according to an unused memory of a buffer communicatively coupled to the auxiliary multiplexer, the buffer for buffering the auxiliary data.

15.     (PREVIOUSLY PRESENTED) The apparatus of claim 14, wherein the multiplexer changes the allocation of the data presented at the plurality of inputs to the statistical multiplexer output according to an unused memory of the buffer.

16.     (CURRENTLY AMENDED) A method of adding auxiliary data $D_A$ to a data stream, comprising the steps of:
        accepting a statistically multiplexed data stream having null data;
        substituting at least a portion of the auxiliary data $D_A$ for the null data in the statistically multiplexed data stream; and
        prior to the substitution of the at least a portion of the auxiliary data $D_A$ for the null data in the statistically multiplexed data stream, controlling an amount of the null data in the statistically multiplexed data stream to provide sufficient null data to permit the substitution of at least some of the auxiliary data $D_A$ in the statistically multiplexed data stream.

17.     (PREVIOUSLY PRESENTED) The method of claim 16, wherein the auxiliary data $D_A$ is non-opportunistic data.

18.     (PREVIOUSLY PRESENTED) The method of claim 16, further comprising the step of:
        buffering the auxiliary data $D_A$ until there is sufficient null data to permit the substitution of the at least some of the auxiliary data $D_A$ in the statistically multiplexed data stream.

19.     (CANCELED)

-5-

Serial No. 10/038,174

20.     (PREVIOUSLY PRESENTED) The method of claim 18, wherein the amount of null data is controlled according to a relationship between an amount of the buffered auxiliary data $D_A$ and a capacity of a buffer storing the buffered data.

21.     (PREVIOUSLY PRESENTED) The method of claim 16, wherein the null data comprises statistical multiplexer null data $N_{SM}$.

22.     (PREVIOUSLY PRESENTED) The method of claim 21, wherein the statistically multiplexed data stream is statistically multiplexed to a throughput less than or equal to a target throughput value $BW_T$, and the step of controlling an amount of null data in the statistically multiplexed data stream comprises the step of altering the target throughput value $BW_T$.

23.     (PREVIOUSLY PRESENTED) The method of claim 16, wherein the null data comprises encoder null data $N_E$.

24.     (PREVIOUSLY PRESENTED) The method of claim 23, wherein the statistically multiplexed data stream is statistically multiplexed according to a statistical multiplexer equation, and the step of controlling an amount of null data in the statistically multiplexed data stream comprises the step of altering the statistical multiplexer equation.

25.     (PREVIOUSLY PRESENTED) The method of claim 16, further comprising the step of:

examining the auxiliary data $D_A$ for non-essential data; and

eliminating the non-essential data from the auxiliary data $D_A$ before substituting the auxiliary data $D_A$ for the null data in the statistically multiplexed data stream.

26.     (PREVIOUSLY PRESENTED) The method of claim 16, wherein the amount of null data in the statistically multiplexed data stream is controlled according to a parameter set describing the auxiliary data $D_A$, including:

a minimum throughput required to keep the data service active $BW_{MIN}$;

-6-

Serial No. 10/038,174

a maximum sustained throughput of the data service $BW_{MAX}$; and

a nominal or guaranteed rate over a time period $BW_{AVG}$.

27.    (PREVIOUSLY PRESENTED) The method of claim 16, wherein the data stream comprises a set of data packets all having a packet ID including a first data packet and a second data packet temporally adjacent the first data packet, and the step of substituting at least a portion of the auxiliary data $D_A$ for the null data in the statistically multiplexed data stream comprises the steps of:

substituting at least a portion of the auxiliary data $D_A$ for the data in the second data packet if the first data packet includes at least a number $NB$ consecutive zero data values and the second data packet includes all zero data values.

Serial No. 10/038,174

28.     (PREVIOUSLY PRESENTED) A system for transmitting auxiliary data $D_A$ packetized satellite signal, comprising:

a statistical multiplexer having a plurality of inputs including a first input, and an output providing an output data stream;

a first encoder, having an output communicatively coupled to the a first statistical multiplexer input, the first encoder for compressing a first data stream $D$, according to a first actual data rate $BW_A$, that is less than or equal to a first granted data rate $BW_{G_1}$ granted by the statistical multiplexer in response to a requested data rate. $BW_{R_1}$ from the encoder, the difference between the first actual data rate $BW_{A_1}$ and the first granted data rate $BW_{G_1}$ defining an encoder overhead rate $BW_{OE_1}$ such that $BW_{G_1} - BW_{A_1} = BW_{OE_1} \geq 0$, the first encoder having an output including an compressed version of the first data stream $d_1$ provided at the actual data rate $BW_{A_1}$ and encoder null data $N_{E_1}$ at the overhead rate $BW_{O1}$; and

an auxiliary multiplexer, communicatively coupled to the statistical multiplexer, for sensing encoder null data $N_E$ and for substituting at least a portion of the auxiliary data $D_A$ for the encoder null data $N_E$;

a modulator communicatively coupled to the auxiliary multiplexer, for modulating the output data stream;

a transmitter, communicatively coupled to the modulator for transmitting the output data stream; and

a transponder, for receiving the transmitted modulated output data stream and for retransmitting the received output data stream to a subscriber.


29.     (PREVIOUSLY PRESENTED) A method of adding non-opportunistic auxiliary data $D_A$ to a data stream, comprising the steps of:

accepting a statistically multiplexed data stream having null data; and

substituting at least a portion of the non-opportunistic auxiliary data $D_A$ for the null data in the statistically multiplexed data stream.

-8-

Serial No. 10/038,174

30.    (PREVIOUSLY PRESENTED)  The method of claim 29, further comprising the step of:

buffering the auxiliary data $D_A$ until there is sufficient null data to permit the substitution of the at least some of the auxiliary data $D_A$ in the statistically multiplexed data stream.

-9-